Regrid Service

The Regrid service accepts the latitude-longitude boundaries of a spatial window, the start and end times of a temporal window, and spatial and temporal step sizes, and returns a data structure containing a summary statistic computed from data falling within each cell of a spatio-temporal grid defined by the input arguments. The spatio-temporal grid is an $n_{lat} \times n_{lon} \times n_t$ data "cube", where

$$\begin{aligned} n_{lat} &= \lceil (lat_{max} - lat_{min})/lat_{step} \rceil, \\ n_{lon} &= \lceil (lon_{max} - lon_{min})/lon_{step} \rceil, \\ n_t &= \lceil (t_{max} - t_{min})/t_{step} \rceil. \end{aligned}$$

lat_{max}, lon_{max}, lat_{min}, lon_{min}, t_{max}, and t_{min} are the maximum and minimum values of latitude, longitude, and time. lat_{step}, lon_{step}, and t_{step} are the corresponding step sizes.

Data to be regridded are sorted into the appropriate cells of the spatio-temporal grid, and summarized by a statistic computed from the data in each cell. Currently, the summary statistic is the mean:

$$\bar{X}_{lat,lon,t} = \frac{1}{N_{lat,lon,t}} \sum_{i=1}^{N_{lat,lon,t}} X_{lat,lon,t,i},$$

where $X_{lat,lon,t,i}$ is the ith datum sorted into the grid cell indexed by (lat, lon, t), and $N_{lat,lon,t}$ is the number of data points sorted into the grid cell indexed by (lat, lon, t). In the future, other summary statistics will be available.